

# EFFICIENT OXYGEN TRANSFER IN WASTEWATER AERATION

CUSTOMISED  
DIFFUSER SYSTEMS



## ENERGY EFFICIENT SYSTEMS WITH FINE BUBBLE DIFFUSERS

With energy-efficient fine bubble diffusers, Grundfos customises complete aeration systems for wastewater treatment. Using the actual oxygen rate or standard oxygen rate and your tank data, we can calculate and deliver an engineered system that matches the specific oxygen demand of any treatment plant.

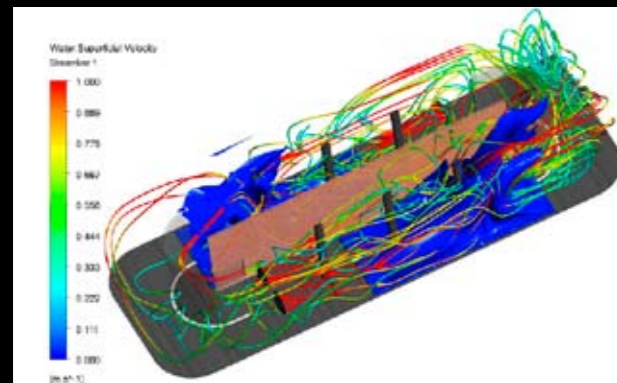
For new build or refurbishment, our systems include pipes and fittings, manifold, anchors and diffusers. A large range of diffusers and materials form the basis for customising systems case by case. Delivery includes complete working layout drawings and a calculation of system performance.

Our reference list includes projects from 2000 – 35,000 diffusers in industrial and municipal wastewater treatment plants around the world.



### Typical application areas

- Process tanks at municipal WWTP
- Process tanks at industrial WWTP
- Sludge stabilisation
- Aerobic digestion
- Post aeration



## SECURING OPTIMAL PERFORMANCE

To complete our offering for process tanks, we offer a full range of mixers and flowmakers. To ensure the optimal interaction between the diffuser system and mixers/flowmakers, we have a dedicated team to make and analyse computational fluid dynamics (CFD) simulations of the process tank. This is to verify the overall performance of the set-up and safeguards installed equipment.

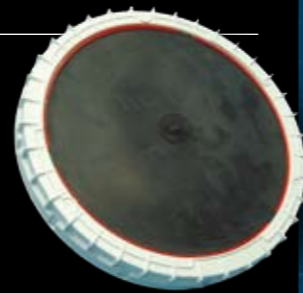
## UNIFORM AERATION AT WIDE RANGE OF AIR RATES

With our large range of sturdy and flexible disc and tube diffusers, our systems can be designed to deliver fine bubbles at a wide range of air rates. By ensuring an even bubble distribution, the diffusers play an important role in maintaining a high oxygen transfer efficiency over time.

The flexibility of the membrane ensures that the diffuser closes fully when the air supply is stopped. This allows for on/off operation of the aeration system without the risk of the membranes blocking in SBR system or in zones of simultaneous nitrification/denitrification.

Ultimately, this means that the air supply can be tailored to fit the actual demand based on monitoring oxygen, ammonium or nitrate concentrations, thus minimising energy consumption.

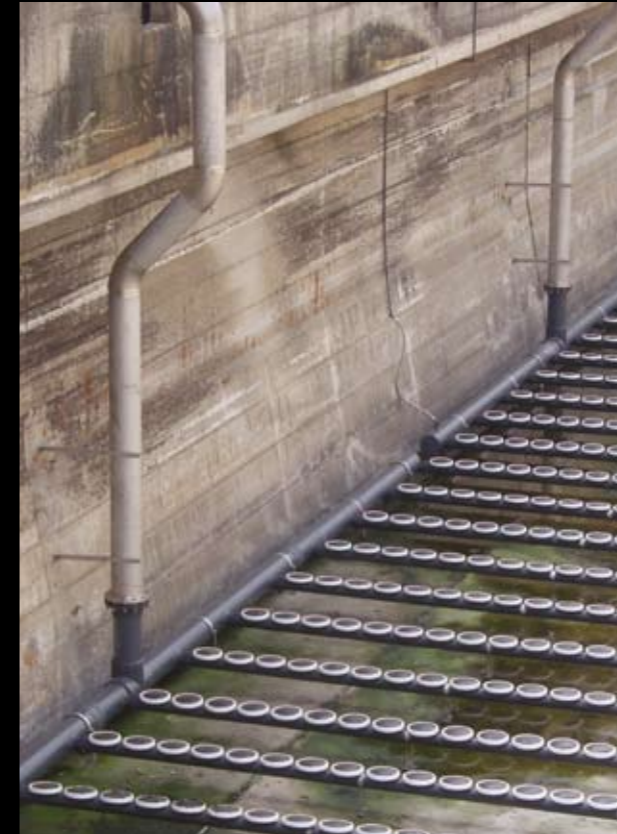
- Diffusers are fitted with a standard durable EPDM membrane. For special wastewater applications other membrane materials are available
- Non-opening knobs on the reinforced diffuser back plate and the 3 times threaded retainer ring ensures that the membrane will not slip off accidentally of the disc diffuser
- The diffuser design and membrane ensure a uniform air distribution and bubble release across the membrane surface at a wide range of air flow rates
- A check valve is integrated in the membrane and furthermore available as an additional separate valve to prevent sludge ingress into the air distribution pipes



## CUSTOMISED DIFFUSER SYSTEMS

When designing aeration systems, Grundfos takes into account the complex interplay of sewage type, temperature, pressure, tank depth, etc. The customisation process is based on the criteria set out by the customer with respect to initial investment levels and long-term standard aeration efficiency (SAE). To meet customer requirements and to provide the required oxygen transfer rate, we then design the optimal system based on components, materials and solutions in our range:

- Fixed and retractable aeration systems
- A large range of disc and tubular diffusers
- System components in a range of materials for different wastewater types
- Automatic and manual condensation purge systems to reduce friction losses
- Different materials for air distribution piping to cope with *different* air temperatures



Fixed systems are cost effective for large installations



Retractable systems for easy maintenance

## FAST INSTALLATION ON SITE

To minimize construction time, a Grundfos aeration system is preassembled. We deliver partially assembled diffuser systems on-site in carefully numbered crates and boxes, itemised in detail. This makes installation a simple matter of fitting the pieces together like a kitset.

- All gluing, solvent welding and cutting is done in the workshop before shipment
- With one-bolt connections, installation of the air distribution pipes on-site is fast and easy.
- Diffuser holders are installed from factory which eliminates field levelling of individual diffusers

- The polypropylene (PP) diffuser units are pre-assembled and ready to screw on which minimise installation time and erroneous assembly on-site
- Fully adjustable piping supports in stainless steel for flexibility in installation
- Expansion/contractions are controlled through mechanically fixed flanges in sliding supports

## SEE THE BIGGER PICTURE

Grundfos is a global leader within water handling technology. Our passion is to bring you all the products you require to create and operate pump systems that combine reliability, cost-efficiency – and innovation. Our products are for use in water supply and wastewater infrastructure on any scale.

Grundfos has a full line of products and systems for the intake, treatment and distribution of drinking water and for the transport and treatment of wastewater. We also offer expertise and industry insight that can increase reliability and reduce lifecycle costs for water utilities.

Key product areas include:



Submersible pumps



Surface pumps



Sewage pumps



Mixers, flowmakers & recirculation pumps



Pumping stations



Monitoring & controls



Dosing & disinfection



Aeration equipment

Our products are the result of decades of engineering expertise. Supported by a worldwide service network. Visit [grundfos.com/water-utility](http://grundfos.com/water-utility) for more.

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